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10/678,083	10/06/2003	Shunpei Yamazaki	0756-7209	4411

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ERIC ROBINSON
PMB 955
21010 SOUTHBANK ST.
POTOMAC FALLS, VA 20165

EXAMINER	
GREEN, PHILLIP	

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 03/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/678,083	**Applicant(s)** YAMAZAKI ET AL.	
	Examiner Phillip S. Green	**Art Unit** 2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 January 2006*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-18,20,21 and 24-37* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *10-18,20-21 and 24-37* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01/09/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 1/09/2005 was filed before the mailing a final action. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 10, 13-14, 20, 24-25, 28, 31, 33 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato et al. (US 5,304,357) in view of Ogawa et al (JP 2001044120).

Pertaining to claim 10, Sato teaches a method for manufacturing a semiconductor device comprising the steps of:

first laser beam **51** with a wavelength of below about 1.2 μm; and (Note Column 8, lines 43-46)

crystallizing the semiconductor film by irradiating a second laser beam **52** of a fundamental wave and the long beam at the same time to a region of the surface while moving the surface relatively with respect to the long beam in a direction. (Note Column 12, lines 13-56).

Sato fails to explicitly teach a first laser beam with a wavelength of visible light or a shorter wavelength than visible light into a long beam at a surface of a semiconductor film or a vicinity thereof; and

However, Ogawa teaches forming a thin film with a first pulse laser beam in the ultra-violet region, while the second pulse laser beam is the pulse laser beam in the visible region. (Note: Abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicants' claimed invention was made to provide a laser beam in the ultra-violet region with a second laser beam in the visible region of Ogawa with the invention of Sato in order "to form a thin film having excellent crystalline property to manufacture a high performance thin film transistor." (Note: Abstract).

Pertaining to claim 13, Sato and Ogawa teach the limitations of claim 10 in the paragraph above, including, wherein each of the first and second oscillators **27 and 31** is selected from the group consisting of continuous wave gas laser, solid laser and metal laser. (Note: Column 8, line 42 – Column 9, line 16).

Pertaining to claim 14, Sato and Ogawa teach the limitations of claim 10 in the paragraph above, including, wherein each of the first and second oscillators is selected from the group consisting of Ar laser, $C0_2$ laser and YAG laser. (Note: Column 8, line 42 – Column 9, line 16).

Pertaining to claim 28, Sato and Ogawa teach the limitations of claim 10 in the paragraph above, including, wherein the long beam is longer than the second laser beam. (Note: Ogawa, Figure on the cover; Examiner takes the position that beam 3 is longer than beam 4 as shown by the figure.).

Pertaining to claim 33, Sato and Ogawa teach the limitations of claim 10 in the paragraph above, including, wherein the second laser beam is absorbed in the semiconductor film melted by the long beam. (Note: Abstract).

Pertaining to claim 20, Sato teaches a method for manufacturing a semiconductor device comprising the steps of:

first laser beam **51** with a wavelength of below about 1.2 μm; and (Note: Column 8, lines 43-46);

crystallizing the semiconductor film by irradiating a second laser beam **52** of a fundamental wave and the long beam to a region of the surface while moving the surface relatively with respect to the long beam in a direction, (Note: Column 12, lines 13-56); and

wherein the long beam **51** is overlapped with the second laser beam **52** at the region. (Note: Column 9, line 5-15).

Sato fails to explicitly teach a first laser beam with a wavelength of visible light or a shorter wavelength than visible light into a long beam at a surface of a semiconductor film or a vicinity thereof; and

However, Ogawa teaches forming a thin film with a first pulse laser beam in the ultra-violet region, while the second pulse laser beam is the pulse laser beam in the visible region. (Note: Abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicants' claimed invention was made to provide a laser beam in the ultra-violet region with a second laser beam in the visible region of Ogawa with the invention of Sato in order "to form a thin film having excellent crystalline property to manufacture a high performance thin film transistor." (Note: Abstract).

Pertaining to claim 24, Sato and Ogawa teach the limitations of claim 20 in the paragraph above, including, wherein each of the first and second oscillators **27 and 31** is selected from the group consisting of continuous wave gas laser, solid laser and metal laser. (Note: Column 8, line 42 – Column 9, line 16).

Pertaining to claim 25, Sato and Ogawa teach the limitations of claim 20 in the paragraph above, including, wherein each of the first and second oscillators is selected from the group consisting of Ar laser, CO_2 laser and YAG laser. (Note: Column 8, line 42 – Column 9, line 16).

Pertaining to claim 31, Sato and Ogawa teach the limitations of claim 20 in the paragraph above, including, wherein the long beam is longer than the second laser beam. (Note: Ogawa, Figure on the cover; Examiner takes the position that beam 3 is longer than beam 4 as shown by the figure.).

Pertaining to claim 36, Sato and Ogawa teach the limitations of claim 10 in the paragraph above, including, wherein the second laser beam is absorbed in the semiconductor film melted by the long beam. (Note: Abstract).

4. Claims 12, 17, 18, 30 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sotani et al (US 6,897,166 B2) in view of Ogawa et al (JP 2001044120).

Pertaining to claim 12, Sotani teaches a method for manufacturing a semiconductor device comprising the steps of:

forming a semiconductor layer over a glass substrate **21**;

forming an insulating layer **24** for covering a top surface and side surface of the semiconductor layer **23**;

forming a conductive layer **25** over the semiconductor layer **23** with the insulating layer **24** there between;

processing a first laser beam with a wavelength of visible light or a shorter wavelength than visible light into a long; and

heating the conductive layer **25** selectively to perform heat treatment of the semiconductor layer **23** and the insulating layer **24** by irradiating a second laser beam of a fundamental wave and the long beam **100** at alternatively to a region of the irradiated surface while moving the irradiated surface relatively in a direction with respect to the long beam. (Note Column 12, Line 12 - Column 13, Line 66).

Sotani fails to explicitly teach a heating the conductive layer **25** selectively to perform heat treatment of the semiconductor layer **23** and the insulating layer **24** by irradiating a second laser beam of a fundamental wave and the long beam **100** at the same time to a region of the irradiated.

However, Ogawa teaches forming a thin film with a first pulse laser beam **(3)** in the ultra-violet region, while the second pulse laser beam **(4)** is the pulse laser beam in the visible region. (Note: Abstract; Figure on Cover).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicants' claimed invention was made to provide a laser beam in the ultra-violet region with a second laser beam in the visible region of Ogawa with the invention of Sotani in order "to form a thin film having excellent crystalline property to manufacture a high performance thin film transistor." (Note: Abstract).

Pertaining to claim 17, Sotani and Ogawa teach the limitations of claim 12 in the paragraph above, including, wherein each of the first and second oscillators has continuous wave solid state laser. (Column 12, Lines 42 – 48).

Pertaining to claim 18, Sotani and Ogawa teach the limitations of claim 12 in the paragraph above, including, wherein each of the first and second oscillators has YAG laser, YVO_4 laser, YLF laser or NYAB laser. (Column 12, Lines 42 – 48).

Pertaining to claim 30, Sotani and Ogawa teach the limitations of claim 12 in the paragraph above, including, wherein the long beam is longer than the second laser beam. (Note: Ogawa, Figure on the cover; Examiner takes the position that beam 3 is longer than beam 4 as shown by the figure.).

Pertaining to claim 35, Sotani and Ogawa teach the limitations of claim 12 in the paragraph above, including, wherein the second laser beam is absorbed in the semiconductor film melted by the long beam. (Note: Abstract).

5. Claims 11,15-16, 21, 26-27, 29, 32, 34 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al. (US 2003/0136772 A1) in view of Ogawa et al (JP 2001044120).

Pertaining to claim 11, a method for manufacturing a semiconductor device comprising the steps of:

processing a first laser beam with a wavelength of visible light or a shorter wavelength than visible light into a long beam at a surface of a semiconductor film or a vicinity thereof; and (Note Paragraphs [0061-0066]).

activating an impurity region formed in the semiconductor film by irradiating a second laser beam of a fundamental wave and the long beam at the same time to a region of the surface while moving the surface relatively with respect to the long beam in a direction. (Note Paragraph 0183).

Yamazaki does not explicitly teach the combination of a first laser beam with a wavelength of visible light or a shorter wavelength than visible light and a second laser beam of a fundamental wave.

However, Ogawa teaches forming a thin film with a first pulse laser beam **(3)** in the ultra-violet region, while the second pulse laser beam **(4)** is the pulse laser beam in the visible region. (Note: Abstract; Figure on Cover).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicants' claimed invention was made to provide a laser beam in the ultra-violet region with a second laser beam in the visible region of Ogawa with the invention of Yamazaki in order "to form a thin film having excellent crystalline property to manufacture a high performance thin film transistor." (Note: Abstract).

Pertaining to claim 15, Yamazaki and Ogawa teach the limitations of claim 11 in the paragraph above, including, wherein each of the first and second oscillators has continuous wave gas laser, solid laser, or metal laser. (Note Paragraph 0058).

Pertaining to claim 16, Yamazaki and Ogawa teach the limitations of claim 11 in the paragraph above, including, wherein each of the first and second oscillators has Ar laser, Kr laser, CO_2 laser, YAG laser, $YV0_4$ laser, YLF laser, $YAlO_3$ laser, ruby laser, alexandrite laser, Ti:sapphire laser, helium-cadmium laser, copper vapor laser, or gold vapor laser. (Note Paragraph 0058).

Pertaining to claim 29, Yamazaki and Ogawa teach the limitations of claim 11 in the paragraph above, including, wherein the long beam is longer than the second laser beam. (Note: Ogawa, Figure on the cover; Examiner takes the position that beam 3 is longer than beam 4 as shown by the figure.).

Pertaining to claim 34, Yamazaki and Ogawa teach the limitations of claim 11 in the paragraph above, including, wherein the second laser beam is absorbed in the semiconductor film melted by the long beam. (Note: Abstract).

Pertaining to claim 21, Yamazaki teaches a method for manufacturing a semiconductor device comprising the steps of:

processing a first laser beam with a wavelength of visible light or a shorter wavelength than visible light into a long beam at a surface of a semiconductor film or a vicinity thereof; and (Note Paragraphs [0061-0066]).

activating an impurity region formed in the semiconductor film by irradiating a second laser beam of a fundamental wave and the long beam at the same time to a region of the surface while moving the surface relatively with respect to the long beam in a direction, (Note Paragraph 0183).

wherein the long beam is overlapped with the second laser beam at the region. (Note Paragraphs 0067 and 0119).

Yamazaki does not explicitly teach the combination of a first laser beam with a wavelength of visible light or a shorter wavelength than visible light and a second laser beam of a fundamental wave.

However, Ogawa teaches forming a thin film with a first pulse laser beam **(3)** in the ultra-violet region, while the second pulse laser beam **(4)** is the pulse laser beam in the visible region. (Note: Abstract; Figure on Cover).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of applicants' claimed invention was made to provide a laser beam in the ultra-violet region with a second laser beam in the visible region of Ogawa with the invention of Yamazaki in order "to form a thin film having excellent crystalline property to manufacture a high performance thin film transistor." (Note: Abstract).

Pertaining to claim 26, Yamazaki and Ogawa teach the limitations of claim 21 in the paragraph above, including, wherein each of the first and second oscillators has continuous wave gas laser, solid laser, or metal laser. (Note Paragraph 0058).

Pertaining to claim 2~~6~~7, Yamazaki and Ogawa teach the limitations of claim 21 in the paragraph above, including, wherein each of the first and second oscillators has Ar

laser, Kr laser, CO_2 laser, YAG laser, $YV0_4$ laser, YLF laser, $YAlO_3$ laser, ruby laser, alexandrite laser, Ti:sapphire laser, helium-cadmium laser, copper vapor laser, or gold vapor laser. (Note Paragraph 0058).

Pertaining to claim 32, Yamazaki and Ogawa teach the limitations of claim 21 in the paragraph above, including, wherein the long beam is longer than the second laser beam. (Note: Ogawa, Figure on the cover; Examiner takes the position that beam 3 is longer than beam 4 as shown by the figure.).

Pertaining to claim 37, Yamazaki and Ogawa teach the limitations of claim 21 in the paragraph above, including, wherein the second laser beam is absorbed in the semiconductor film melted by the long beam. (Note: Abstract).

Response to Arguments

6. Applicant's arguments with respect to claims 10-18 and 20-27 have been considered but are moot in view of the new ground(s) of rejection.

7. The objections of claims 13-18 and 24-27 previously stated in the First Office Action has been corrected, subsequently, the objection has been withdrawn.

8. The rejection of claims 12, 17 and 18 are withdrawn since, appropriate correction has been made.

Conclusion

9. **THIS ACTION IS MADE NON- FINAL** because of a new ground of rejection is made under 35 U.S.C. 112 2nd Paragraph and U.S.C. 103.

Correspondence

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip S. Green whose telephone number is (571) 272-7024. The examiner can normally be reached on Monday thru Thursday 8:30 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PG
2/24/2005

Brook Kebede

BROOK KEBEDE
PRIMARY EXAMINER